MATH 4328.001 Discrete Mathematics II

Department of Mathematics and Statistics

Spring 2019

A. COURSE INFORMATION

Course number/section: MATH 4328.001
Class meeting time: T R 3:30-4:45 PM
Class location: OCNR-222
Course Website: https://bb9.tamucc.edu/

B. INSTRUCTOR INFORMATION

Instructor: Dr. Alexey L Sadovski
Office location: CI-338
Office hours: T R 12 noon -2 PM F 9:00-10:00 AM
Telephone: (361) 825-2477
E-mail: Alexey.Sadovski@tamucc.edu
Appointments: Appointments also available. Office hours subject to meetings related to other duties on campus. They may change during the semester.

C. COURSE DESCRIPTION

Catalog Course Description
A continued study of topics from Discrete Mathematics-I with topics that have strong applications to computer science and mathematics. Additional topics include recurrence relations, formal languages and finite-state machines.

D. PREREQUISITES FOR THE COURSE

COSC 2437 and MATH 2305.

E. TEXT AND OTHER SUPPLIES REQUIRED


F. STUDENT LEARNING OUTCOMES AND ASSESSMENT

Assessment is a process used by instructors to help improve learning. Assessment is essential for effective learning because it provides feedback to both students and instructors. A critical step in this process is making clear the course’s student learning outcomes that describe what students are expected to learn to be successful in the course. The student learning outcomes for this course are listed below. By collecting data and sharing it with students on how well they are accomplishing these learning outcomes
students can more efficiently and effectively focus their learning efforts. This information can also help instructors identify challenging areas for students and adjust their teaching approach to facilitate learning.

By the end of this course, students should be able to:

1. Apply regular and strong mathematical induction. Demonstrate knowledge of the well-ordering of the integers and its equivalence with mathematical induction.

2. Use the characteristic polynomial to synthesize closed-form solutions for selected recursively-defined sequences.

3. Comprehend selected properties of graphs, their spanning trees, and their representations as matrices.

4. Demonstrate the ability to explain finite-state automata, regular expressions, regular languages and their equivalence.

5. Exhibit knowledge of other topics to include (as time permits) the halting problem, the use of cardinality in demonstrating non-computability, and public-key cryptography.

G. INSTRUCTIONAL METHODS AND ACTIVITIES

Methods and activities for instruction include: Lectures, assignments and quizzes.

H. MAJOR COURSE REQUIREMENTS AND GRADING

<table>
<thead>
<tr>
<th>Type of assignment</th>
<th>Weight</th>
</tr>
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<tbody>
<tr>
<td>Class participation/in-class work</td>
<td>5%</td>
</tr>
<tr>
<td>Quizzes (5-6 over the semester)</td>
<td>40%</td>
</tr>
<tr>
<td>Midterm exams (2 tests)</td>
<td>30%</td>
</tr>
<tr>
<td>Final</td>
<td>25%</td>
</tr>
</tbody>
</table>

Letter grades will be assigned according to the table:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>86 to 100</td>
</tr>
<tr>
<td>B</td>
<td>76 to 85</td>
</tr>
<tr>
<td>C</td>
<td>66 to 75</td>
</tr>
<tr>
<td>D</td>
<td>56 to 65</td>
</tr>
<tr>
<td>F</td>
<td>below 56</td>
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</tbody>
</table>
Quizzes: No open books and notes. Quizzes are on understanding of the basic material of the course.

Midterm and Final: I will discuss these in more detail as the times for them approach. The midterm will be given outside of class time so as to allow a longer period of time for you to take it. To compensate you for the time spent on the midterm, there will be no class meetings that week. Dates for the midterm and final are:

I. COURSE CONTENT/SCHEDULE

<table>
<thead>
<tr>
<th>Week</th>
<th>Content</th>
<th>Week</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>01/14-01/19</td>
<td>Review of basic logic</td>
<td>03/11-03/15</td>
<td>Spring Break</td>
</tr>
<tr>
<td>01/21-01/26</td>
<td>Multiple quantifiers</td>
<td>03/18-03/22</td>
<td>Probability axioms</td>
</tr>
<tr>
<td>01/28-02/01</td>
<td>Proof and counterexample</td>
<td>03/25-03/29</td>
<td>Graph isomorphism</td>
</tr>
<tr>
<td>02/04-02/08</td>
<td>Correctness of algorithms</td>
<td>04/01-04/05</td>
<td>Review and Exam 2</td>
</tr>
<tr>
<td>02/11/-02/15</td>
<td>Recurrences</td>
<td>04/08-04/12</td>
<td>Analysis of algorithms</td>
</tr>
<tr>
<td>02/18/-02/22</td>
<td>Review and Exam 1</td>
<td>04/15-04/19</td>
<td>Regular Expressions</td>
</tr>
<tr>
<td>02/25/-03/01</td>
<td>Modular arithmetic</td>
<td>04/22-04/26</td>
<td>Finite automata</td>
</tr>
<tr>
<td>03/04-03/08</td>
<td>Partial order</td>
<td>04/29-05/03</td>
<td>Review</td>
</tr>
</tbody>
</table>

Final Exam will take place on Thursday, May 9, at 1:45 PM in OCNR-222

J. COURSE POLICIES

Attendance/Tardiness:
required

Late Work and Make-up Exams:
N/A
Extra Credit
N/A
Cell Phone Use
N/A
Laptop Use
yes
Food in Class
no

Missed Exam
N/A
Participation
required
Others
N/A

K. COLLEGE AND UNIVERSITY POLICIES

- Academic Integrity (University)
  University students are expected to conduct themselves in accordance with the highest standards of academic honesty. Academic misconduct for which a student is subject to penalty includes all forms of cheating, such as illicit possession of examinations or examination materials, falsification, forgery, complicity or plagiarism. (Plagiarism is the presentation of the work of another as one’s own work.) In this class, academic misconduct or complicity in an act of academic misconduct on an assignment or test will result in a failing grade.

- Classroom/Professional Behavior
  Texas A&M University-Corpus Christi, as an academic community, requires that each individual respect the needs of others to study and learn in a peaceful atmosphere. Under Article III of the Student Code of Conduct, classroom behavior that interferes with either (a) the instructor’s ability to conduct the class or (b) the ability of other students to profit from the instructional program may be considered a breach of the peace and is subject to disciplinary sanction outlined in article VII of the Student Code of Conduct. Students engaging in unacceptable behavior may be instructed to leave the classroom. This prohibition applies to all instructional forums, including classrooms, electronic classrooms, labs, discussion groups, field trips, etc.

- Statement of Civility
  Texas A&M University-Corpus Christi has a diverse student population that represents the population of the state. Our goal is to provide you with a high quality educational experience that is free from repression. You are responsible for following the rules of the University, city, state and federal government. We expect that you will behave in a manner that is dignified, respectful and courteous to all people, regardless of sex, ethnic/racial origin, religious background, sexual orientation or disability. Behaviors that infringe on the rights of another individual will not be tolerated.
• **Deadline for Dropping a Course with a Grade of W (University)**
  I hope that you never find it necessary to drop this or any other class. However, events can sometimes occur that make dropping a course necessary or wise. **Please consult with your academic advisor, the Financial Aid Office, and me, before you decide to drop this course.** Should dropping the course be the best course of action, **you must initiate the process to drop the course by going to the Student Services Center and filling out a course drop form. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class.** Please consult the Academic Calendar ([http://www.tamucc.edu/academics/calendar/](http://www.tamucc.edu/academics/calendar/)) for the last day to drop a course.

• **Grade Appeals (College of Science and Engineering)**
  As stated in University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures, a student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is upon the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is encouraged to first discuss the matter with the instructor. For complete details, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, see University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules website at [http://www.tamucc.edu/provost/university_rules/index.html](http://www.tamucc.edu/provost/university_rules/index.html), and the College of Science and Engineering Grade Appeals webpage at [http://sci.tamucc.edu/students/GradeAppeal.html](http://sci.tamucc.edu/students/GradeAppeal.html). For assistance and/or guidance in the grade appeal process, students may contact the chair or director of the appropriate department or school, the Office of the College of Science and Engineering Dean, or the Office of the Provost.

• **Disability Services**
  The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please call (361) 825-5816 or visit Disability Services in Corpus Christi Hall 116.

  If you are a returning veteran and are experiencing cognitive and/or physical access issues in the classroom or on campus, please contact the Disability Services office for assistance at (361) 825-5816.

  [http://disabilityservices.tamucc.edu/](http://disabilityservices.tamucc.edu/)

• **Statement of Academic Continuity**
  In the event of an unforeseen adverse event, such as a major hurricane and classes
could not be held on the campus of Texas A&M University–Corpus Christi; this course would continue through the use of Blackboard and/or email. In addition, the syllabus and class activities may be modified to allow continuation of the course. Ideally, University facilities (i.e., emails, web sites, and Blackboard) will be operational within two days of the closing of the physical campus. However, students need to make certain that the course instructor has a primary and a secondary means of contacting each student.

- [Other important policies]

A. OTHER INFORMATION

- Academic Advising
  The College of Science & Engineering requires that students meet with an Academic Advisor as soon as they are ready to declare a major. The Academic Advisor will set up a degree plan, which must be signed by the student, a faculty mentor, and the department chair. Meetings are by appointment only; advisors do not take walk-ins. Please call or stop by the Advising Center to check availability and schedule an appointment. The College’s Academic Advising Center is located in Center for Instruction 350 or can be reached at (361) 825-3928.

[delete and insert any additional notes, your expectations of the students, etc.]

GENERAL DISCLAIMER

I reserve the right to modify the information, schedule, assignments, deadlines, and course policies in this syllabus if and when necessary. I will announce such changes in a timely manner during regularly scheduled lecture periods.